

Preface

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Preface

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

About the Manual

The manual consists of the following:

Chapter 1

Introducing the Motherboard

Describes features of the motherboard

Go to ➞ page 1

Chapter 2

Installing the Motherboard

Describes installation of motherboard components

Go to ➞ page 9

Chapter 3

Using BIOS

Provides information on using the BIOS Setup Utility

Go to ➞ page 27

Chapter 4

Using the Motherboard Software

Describes the motherboard software

Go to ➞ page 57

Chapter 5

Intel® Matrix Storage Manager RAID Configurations

Describes the Intel® Matrix Storage Manager RAID Configurations

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Trouble Shooting

Provides basic trouble shooting tips

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Chapter 1

Introducing the Motherboard

Introduction

Thank you for choosing the H67H2-M motherboard. This motherboard is a high performance, enhanced function motherboard designed to support the latest socket LGA1155 Intel® 2nd Generation Core™ i7, i5, i3, Pentium & Celeron processors for high-end business or personal desktop markets.

This motherboard is based on Intel® H67 Chipset for best desktop platform solution. H67 is a single-chip, highly integrated, high performance Hyper-Threading peripheral controller, unmatched by any other single chip-device controller. This motherboard supports up to 16 GB of system memory with dual channel DDR3 1333/1066 SDRAM. One PCI is supported, fully compliant with PCI rev 2.3 specification at 33MHz. High resolution graphics via PCI Express x 16 slot, intended for Graphics Interface, is fully compliant to the PCI Express Base Specification revision 2.0. In addition, two PCI Express slots are supported. It implements an EHCI (Enhanced Host Controller Interface) compliant interface that provides twelve USB 2.0 ports (four USB 2.0 ports at the back panel and four USB 2.0 headers support additional eight USB 2.0 ports). The gray USB 2.0 header provides with EZ charger technology, please reference chapter 2 parts of [Front Panel USB headers](#) to check the detail information. H67H2-M implements extra USB 3.0 chips which provide two USB 3.0 ports* at rear I/O with blue connector also.

The motherboard is equipped with advanced full set of I/O ports in the rear panel, including one VGA port, one DVI port, one CLR_CMOS button, one Display port, one HDMI port, one eSATA port, Dual Giga Lan ports, four USB 2.0 ports, two USB 3.0 ports(blue connector), one optical SPDIFO port and audio jacks for microphone, line-in and 8-ch line-out.

In addition, this motherboard supports two SATA 6Gb/s connectors and three SATA 3Gb/s connectors for expansion, comes with a power on button, a reset button and Post LED designed for user friendly.



**The USB 3.0 connectors are optimized for SuperSpeed USB 3.0 devices, aslo are fully backwards-compatible with Hi-Speed USB 2.0 devices.*

Feature

Processor

The motherboard uses an LGA1155 type of socket that carries the following features:

- Accommodates latest socket LGA1155 Intel® 2nd Generation Core™ i7, i5, i3, Pentium & Celeron processors
- Supports "Hyper-Threading" technology CPU
- One PCI Express x16 Gen2 port supporting up to 5 GB/s direction peak bandwidth

"Hyper-Threading" technology enables the operating system into thinking it's hooked up to two processors, allowing two threads to be run in parallel, both on separate "logical" processors within the same physical processor.

Chipset

The Intel H67 Chipset is a single-chip with proven reliability and performance.

- Support two PCI Express slots
- Integrated two SATA 6.0 Gb/s Host Controller
- Integrated three SATA 3.0 Gb/s Host Controller
- Twelve USB 2.0 ports supported
- Serial Peripheral Interface (SPI) support
- Integrated Graphics Support with PAVP 1.5
- Intel® High Definition Audio Controller

Extra Chips

- ITE IT8893 PCI Bridge supports one PCI slot expansion
- Etron USB 3.0 Controller supports two USB 3.0 ports at the back panel (Compatible with USB 2.0)

Memory

- Supports DDR3 1333/1066 DDR3 SDRAM with Dual-channel architecture
- Accommodates four unbuffered DIMMs
- Up to 4 GB per DIMM with maximum memory size up to 16 GB

Audio

- 7.1+2 Channel High Definition Audio Codec
- Meets Microsoft WLP3.x (Windows Logo Program) audio requirements
- All DACs supports 44.1k/48k/96k/192kHz sample rate
- Software selectable 2.5V/3.2V/4.0V VREFOUT
- Direct Sound 3D. compatible
- Power Support: Digital: 3.3V; Analog: 5.0V

Giga LAN

- Supports PCI Express™ 1.1
- Integrated 10/100/1000 transceiver
- Wake-on-LAN and remote wake-up support

Expansion Options

The motherboard comes with the following expansion options:

- One PCI Express x16 slot for Graphic Interface
- Two PCI Express slots
- One 32-bit PCI v2.3 compliant slot
- Five SATA connectors

Integrated I/O

The motherboard has a full set of I/O ports and connectors:

- Two LAN ports
- One VGA port
- One HDMI port
- One DVI port
- One CLR_CMOS button
- One Display port
- One eSATA port
- Four USB 2.0 ports
- Two USB 3.0 ports* (Compatible with USB 2.0)
- One optical SPDIFO port
- Audio jacks for microphone, line-in and 8-ch line-out



**The USB 3.0 connectors are optimized for SuperSpeed USB 3.0 devices, aslo are fully backwards-compatible with Hi-Speed USB 2.0 devices.*

BIOS Firmware

This motherboard uses AMI BIOS that enables users to configure many system features including the following:

- Power management
- Wake-up alarms
- CPU parameters
- CPU and memory timing
- Graphic parameters

The firmware can also be used to set parameters for different processor clock speeds.



1. Some hardware specifications and software items are subject to change without prior notice.
2. Due to chipset limitation, we recommend that motherboard be operated in the ambience between 0 and 50 ° C.

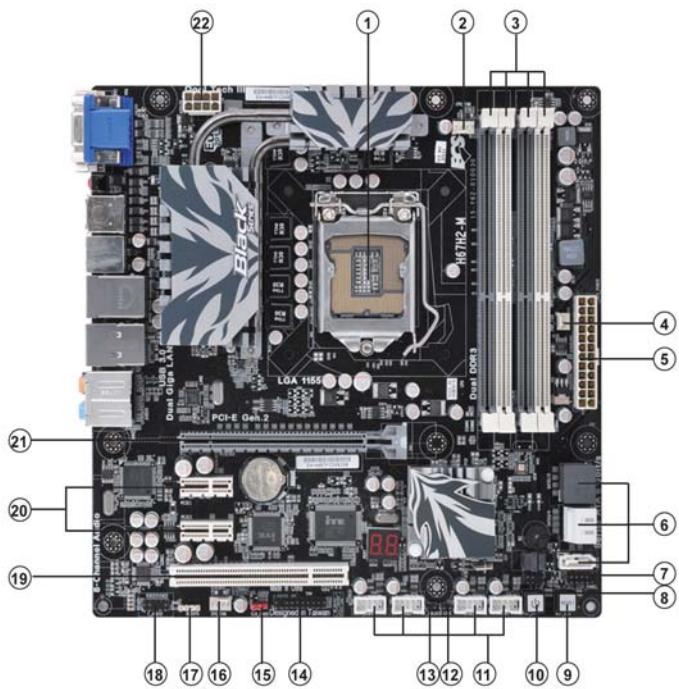
Introducing the Motherboard

Specifications

CPU	<ul style="list-style-type: none"> • latest socket LGA1155 Intel® 2nd Generation Core™ i7, i5, i3, Pentium & Celeron processors • Supports “Hyper-Threading” technology CPU
Chipset	<ul style="list-style-type: none"> • Intel H67 Chipset
Extra Chips	<ul style="list-style-type: none"> • ITE IT8893 PCI Bridge supports one PCI slot expansion • Etron USB 3.0 Controller supports two USB 3.0 ports at the back panel (Compatible with USB 2.0)
Memory	<ul style="list-style-type: none"> • Dual-channel DDR3 memory architecture • 4 x 240-pin DDR3 DIMM sockets support up to 16 GB • Supports 1333/1066 DDR3 SDRAM
Expansion Slots	<ul style="list-style-type: none"> • 1 x PCI Express x16 Gen2 slot • 2 x PCI Express slots • 1 x PCI slot
Storage	<ul style="list-style-type: none"> • Supported by Intel H67 Express Chipset -2 x Serial ATA 6.0 Gb/s Host Controllers -3 x Serial ATA 3.0 Gb/s Host Controllers -1 x eSATA
Audio	<ul style="list-style-type: none"> • Realtek ALC892 8-Ch HD audio
Giga LAN	<ul style="list-style-type: none"> • Dual Realtek 8111E Gigabit Lan
Rear Panel I/O	<ul style="list-style-type: none"> • 4 x USB 2.0 ports • 2 x USB 3.0 ports (Compatible with USB 2.0) • 1 x VGA port • 1 x DVI port • 1 x Display port • 1 x CLR_CMOS button • 1 x HDMI port • 1 x eSATA port • 2 x RJ45 LAN connectors • 1 x Audio port (Line in, microphone in, 8-ch line out and optical SPDIF out)

Internal I/O Connectors & Headers	<ul style="list-style-type: none"> • 1 x 24-pin ATX Power Supply connector • 1 x 8-pin 12V connector • 1 x 4-pin CPU_FAN connector • 1 x 3-pin PWR_FAN connector • 1 x 4-pin SYS_FAN connector • 3 x Serial SATA 3.0 Gb/s connectors • 2 x Serial SATA 6.0 Gb/s connectors • 1 x Front panel switch/LED header • 1 x Front panel audio header • 4 x USB 2.0 headers support additional 8 USB 2.0 ports (F_USB 1 supports EZ charger) • 1 x TPM header • 1 x Chassis intrusion header • 1 x Onboard Buzzer • 1 x Reset button • 1 x Power on button • 1 x SPDIF out header • 1 x Clear CMOS header
System BIOS	<ul style="list-style-type: none"> • AMI BIOS with 32Mb SPI Flash ROM • Supports Plug and Play, STR (S3)/STD (S4), Hardware monitor, Multi Boot • Supports ACPI & DMI • Audio, LAN, can be disabled in BIOS • F7 hot key for boot up devices option • Supports PgUP clear COMS Hotkey • Supports ACPI 3.0 revision • Supports eJIFFY, eBLU, eDLU, eSF • Supports Graphic Over-Clocking • Supports Multi-Monitor technology • Supports Intel Turbo Boost • Supports ECS M.I.B III Utility <ul style="list-style-type: none"> -CPU Voltage Adjustable -Memory Voltage Adjustable -IMC Voltage Adjustable -Graphic Voltage Adjustable
Form Factor	<ul style="list-style-type: none"> • Micro ATX Size, 244mm x 244mm

Motherboard Components



Introducing the Motherboard

Table of Motherboard Components

LABEL	COMPONENTS
1. CPU Socket	latest LGA1155 socket for Intel® 2 nd Generation Core™ i7, i5, i3, Pentium & Celeron processors
2. CPU_FAN	CPU cooling fan connector
3. DDR3_1~4	240-pin DDR3 SDRAM slots
4. PWR_FAN	Power cooling fan connector
5. ATX_POWER	Standard 24-pin ATX power connector
6. SATA1~5	Serial ATA connectors
7. F_PANEL	Front panel switch/LED header
8. BZ	Buzzer
9. RST_BTN	Reset button
10. PWR_BTN	Power on button
11. F_USB1~4	Front panel USB headers (F_USB1 Gray one is for EZ Charger)
12. CASE	CASE open header
13. ME_UNLOCK	ME unlock header-for factory use only
14. TPM	Trusted Platform Module header
15. CLR_CMOS	Clear CMOS jumper
16. SYS_FAN	System cooling fan connector
17. SPDIFO	SPDIF out header
18. F_AUDIO	Front panel audio header
19. PCI	32-bit add-on card slot
20. PCIE1~2	PCI Express x1 slots
21. PCIEX16	PCI Express slot for graphics interface
22. ATX12V	8-pin +12V power connector

This concludes Chapter 1. The next chapter explains how to install the motherboard.

Memo

Chapter 2

Installing the Motherboard

Safety Precautions

- Follow these safety precautions when installing the motherboard
- Wear a grounding strap attached to a grounded device to avoid damage from static electricity
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard
- Leave components in the static-proof bags they came in
- Hold all circuit boards by the edges. Do not bend circuit boards

Choosing a Computer Case

There are many types of computer cases on the market. The motherboard complies with the specifications for the micro ATX system case. Some features on the motherboard are implemented by cabling connectors on the motherboard to indicators and switches on the system case. Make sure that your case supports all the features required.

Most cases have a choice of I/O templates in the rear panel. Make sure that the I/O template in the case matches the I/O ports installed on the rear edge of the motherboard.

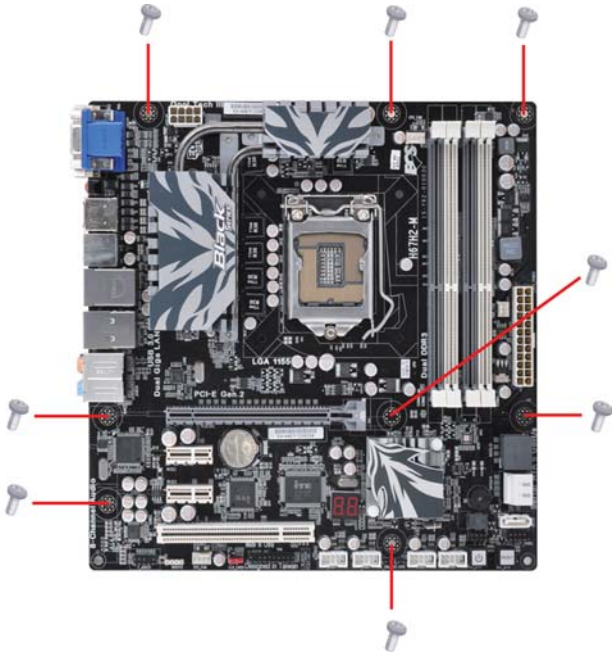
This motherboard carries a micro ATX form factor of 244 x 244 mm. Choose a case that accommodates this form factor.

Installing the Motherboard in a Case

Refer to the following illustration and instructions for installing the motherboard in a case.

Most system cases have mounting brackets installed in the case, which correspond the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.

Ensure that your case has an I/O template that supports the I/O ports and expansion slots on your motherboard.



Do not over-tighten the screws as this can stress the motherboard.

Checking Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.

Setting Jumpers

Use the motherboard jumpers to set system configuration options. Jumpers with more than one pin are numbered. When setting the jumpers, ensure that the jumper caps are placed on the correct pins.

The illustrations show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is **SHORT**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **OPEN**.

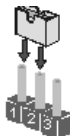


SHORT



OPEN

This illustration shows a 3-pin jumper. Pins 1 and 2 are **SHORT**.




Installing the Motherboard

Checking Jumper Settings

The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.



Jumper Settings

Jumper	Type	Description	Setting (default)	
CLR_CMOS	3-pin	Clear CMOS	1-2: NORMAL 2-3: CLEAR Before clearing the CMOS, make sure to turn off the system.	1  CLR_CMOS



To avoid the system instability after clearing CMOS, we recommend users to enter the main BIOS setting page to “Load Default Settings” and then “Save and Exit Setup”.

Installing Hardware

Installing the Processor



Caution: When installing a CPU heatsink and cooling fan make sure that you DO NOT scratch the motherboard or any of the surface-mount resistors with the clip of the cooling fan. If the clip of the cooling fan scrapes across the motherboard, you may cause serious damage to the motherboard or its components.

On most motherboards, there are small surface-mount resistors near the processor socket, which may be damaged if the cooling fan is carelessly installed.

Avoid using cooling fans with sharp edges on the fan casing and the clips. Also, install the cooling fan in a well-lit work area so that you can clearly see the motherboard and processor socket.

Before installing the Processor

This motherboard automatically determines the CPU clock frequency and system bus frequency for the processor. You may be able to change the settings in the system Setup Utility. We strongly recommend that you do not over-clock processors or other components to run faster than their rated speed.



Warning:

1. Over-clocking components can adversely affect the reliability of the system and introduce errors into your system. Over-clocking can permanently damage the motherboard by generating excess heat in components that are run beyond the rated limits.

2. Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.

This motherboard has an LGA1155 socket. When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.

Fail-Safe Procedures for Over-clocking

When end-users encounter failure after attempting over-clocking, please take the following steps to recover from it.

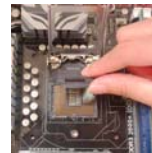
1. Shut down the computer.
2. Press and hold the “Page Up Key (PgUp)” of the keyboard, and then boot the PC up.
3. Two seconds after the PC boots up, release the “Page Up Key (PgUp)”.
4. The BIOS returns to the default setting by itself.

Installing the Motherboard

CPU Installation Procedure

The following illustration shows CPU installation components.

- A. Opening of the Load Plate
 - Put your thumb on the tail of the load plate and press the tail down.
 - Rotate the load plate to fully open position.
- B. Disengaging of the Load Lever
 - Hold the hook of lever and pull it to the left side to clear retention tab.
 - Rotate the load lever to fully open position.
- C. Removing the Cap
 - Be careful not to touch the contact at any time.
- D. Inserting the Package
 - Grasp the package. Ensure to grasp on the edge of the substrate.
 - Make sure pin 1 indicator is on your bottom-left side.
 - Aim at the socket and place the package carefully into the socket by purely vertical motion.
- E. Closing the Load Plate
 - Rotate the load plate onto the package IHS (Intergraded Heat Spreader).
 - Engage the load lever while pressing down lightly onto the load plate.
 - Secure the load lever with the hook under retention tab.
- F. Fasten the cooling fan supporting base onto the CPU socket on the motherboard.
- G. Make sure the CPU fan is plugged to the CPU fan connector. Please refer to the CPU cooling fan user's manual for more detail installation procedure.





- 1. To achieve better airflow rates and heat dissipation, we suggest that you use a high quality fan with 3800 rpm at least. CPU fan and heatsink installation procedures may vary with the type of CPU fan/ heatsink supplied. The form and size of fan/heatsink may also vary.
- 2. DO NOT remove the CPU cap from the socket before installing a CPU.
- 3. Return Material Authorization (RMA) requests will be accepted only if the motherboard comes with the cap on the LGA1155 socket.

Installing Memory Modules

This motherboard accommodates four memory modules. It can support four 240-pin DDR3 1333/1066. The total memory capacity is 16 GB.

DDR3 SDRAM memory module table

Memory module	Memory Bus
DDR3 1066	533 MHz
DDR3 1333	667 MHz

You must install at least one module in any of the four slots. Total memory capacity is 16 GB.

The four DDR3 memory sockets (DDR3_1, DDR3_2, DDR3_3 and DDR3_4) are divided into two channels and each channel has two memory sockets as following:

- ▶▶ Channel A: DDR3_1, DDR3_2
- ▶▶ Channel B: DDR3_3, DDR3_4

Recommend memory configuration

Mode	Sockets			
	DDR3_1	DDR3_2	DDR3_3	DDR3_4
1 DIMM	--	Populated	--	--
1 DIMM	--	--	--	Populated
2 DIMMs	--	Populated	--	Populated
3 DIMMs	Populated	Populated	--	Populated
3 DIMMs	--	Populated	Populated	Populated
4 DIMMs	Populated	Populated	Populated	Populated



Due to Intel CPU spec definition, please follow the table above for recommended memory configuration.



1. For best performance and compatibility, we recommend that users give priority to the white DIMMs (DDR3_2/DDR3_4) when installing DIMMs.
2. We suggest users not to mix memory type. It is recommended to use the same brand and type memory on this motherboard.

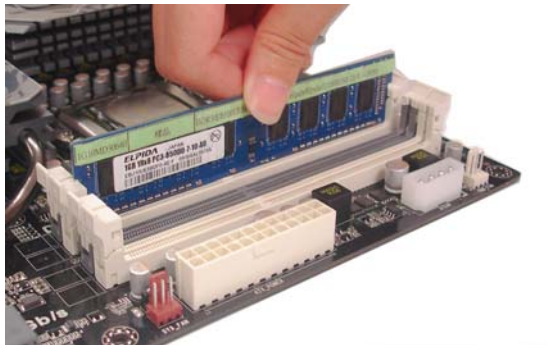


Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.

Installation Procedure

Refer to the following to install the memory modules.

- 1 This motherboard supports unbuffered DDR3 SDRAM .
- 2 Push the latches on each side of the DIMM slot down.
- 3 Align the memory module with the slot. The DIMM slots are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
- 4 Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.
- 5 Install the DIMM module into the slot and press it firmly down until it seats correctly. The slot latches are levered upwards and latch on to the edges of the DIMM.
- 6 Install any remaining DIMM modules.

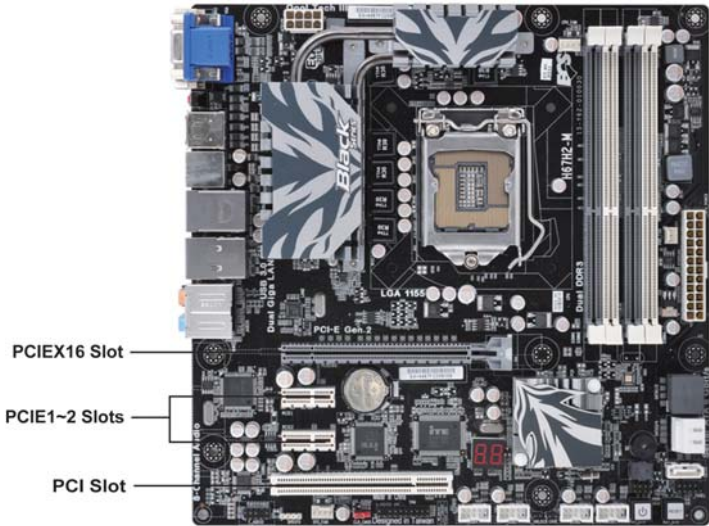


** For reference only*

Expansion Slots

Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard’s features and capabilities. With these efficient facilities, you can increase the motherboard’s capabilities by adding hardware that performs tasks that are not part of the basic system.



- PCIEX16 Slot** The PCI Express x16 slot is used to install an external PCI Express graphics card that is fully compliant to the PCI Express Base Specification revision 2.0.
- PCIe1~2 Slots** The PCI Express x1 slots are fully compliant to the PCI Express Base Specification revision 2.0.
- PCI Slot** This motherboard is equipped with one standard PCI slot. PCI stands for Peripheral Component Interconnect and is a bus standard for expansion cards, which for the most part, is a supplement of the older ISA bus standard. The PCI slot on this board is PCI v2.3 compliant.



Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

Follow these instructions to install an add-on card:

- 1 Remove a blanking plate from the system case corresponding to the slot you are going to use.
- 2 Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.
- 3 Secure the metal bracket of the card to the system case with a screw.

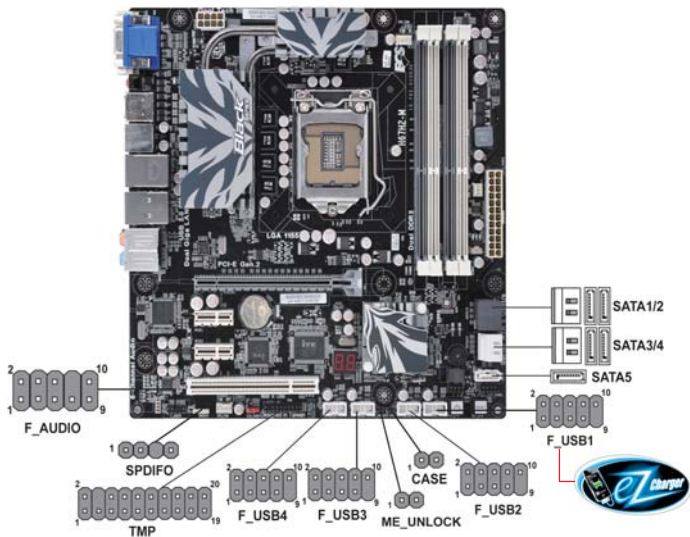


1. For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.
2. The onboard PCI interface does not support 64-bit SCSI cards.

Installing the Motherboard

Connecting Optional Devices

Refer to the following for information on connecting the motherboard’s optional devices:



F_AUDIO: Front Panel Audio header

This header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Pin	Signal Name	Pin	Signal Name
1	PORT 1L	2	AUD_GND
3	PORT 1R	4	PRESENCE#
5	PORT 2R	6	SENSE1_RETURN
7	SENSE_SEND	8	KEY
9	PORT 2L	10	SENSE2_RETURN

SATA1/2: Serial ATA connectors

These connectors are used to support the Serial ATA devices for the highest data transfer rates (6.0 Gb/s), simpler disk drive cabling and easier PC assembly. It doubles the transfer rate of current SATA 3.0Gb/s interface.

Pin	Signal Name	Pin	Signal Name
1	Ground	2	TX+
3	TX-	4	Ground
5	RX-	6	RX+
7	Ground	-	-

SATA3~5: Serial ATA connectors

These connectors are used to support the Serial ATA 3Gb/s devices, simpler disk drive cabling and easier PC assembly. It eliminates limitations of the current Parallel ATA interface. But maintains register compatibility and software compatibility with Parallel ATA.

Pin	Signal Name	Pin	Signal Name
1	Ground	2	TX+
3	TX-	4	Ground
5	RX-	6	RX+
7	Ground	-	-

F_USB1~4: Front Panel USB headers



The motherboard has four USB 2.0 headers supporting eight USB 2.0 ports. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connector to connect the front-mounted ports to the motherboard.

Unlike F_USB2~4 in this mainboard, F_USB1 supports EZ Charger technology, provides 3 times current than general USB port in off mode for USB devices. It is useful and excellent, especially for the iPhone, iPad and iPod touch devices that need a large amount of current for faster recharging within less time.

Pin	Signal Name	Function
1	USBPWR	Front Panel USB Power
2	USBPWR	Front Panel USB Power
3	USB_FP_P0-	USB Port 0 Negative Signal
4	USB_FP_P1-	USB Port 1 Negative Signal
5	USB_FP_P0+	USB Port 0 Positive Signal
6	USB_FP_P1+	USB Port 1 Positive Signal
7	GND	Ground
8	GND	Ground
9	Key	No pin
10	USB_FP_OC0	USB OC-



Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

SPDIFO: SPDIF out header

This is an optional header that provides an SPDIFO (Sony/Philips Digital Interface) output to digital multimedia device through optical fiber or coaxial connector.

Pin	Signal Name
1	+5V
2	NC
3	SPDIFOUT
4	GND

CASE: Chassis Intrusion Detect Header

This detects if the chassis cover has been removed. This function needs a chassis equipped with intrusion detection switch and needs to be enabled in BIOS.

Pin 1-2	Function
Short	Chassis cover is removed
Open	Chassis cover is closed

ME_UNLOCK: ME Unlock Header

Pin 1-2	Function
Short	Unlock
Open	Lock

TPM (optional): TPM module header

Trusted Platform Module (TPM) is a published specification detailing a microcontroller that can store secured information, and implementations of that specification.

Pin	Signal Name	Pin	Signal Name
1	TPM_CLK	11	LAD0
2	GND	12	GND
3	LFRAME#	13	RESERVE0
4	KEY	14	RESERVE1
5	LREST#	15	VCC3_DUAL
6	VCC5	16	SERIRQ
7	LAD3	17	GND
8	LAD2	18	CLKRUN#
9	VCC3	19	LPCPD#
10	LAD1	20	RESERVE2

Installing a SATA Hard Drive

This section describes how to install a SATA Hard Drive.

About SATA Connectors

Your motherboard features five SATA connectors supporting a total of five drives. SATA refers to Serial ATA (Advanced Technology Attachment) is the standard interface for the IDE hard drives which are currently used in most PCs. These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the SATA hard drives.

Installing Serial ATA Hard Drives

To install the Serial ATA (SATA) hard drives, use the SATA cable that supports the Serial ATA protocol. This SATA cable comes with a SATA power cable. You can connect either end of the SATA cable to the SATA hard drive or the connector on the motherboard.



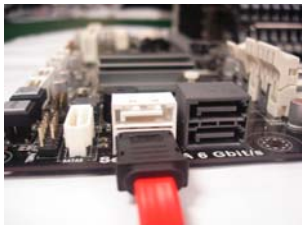
SATA cable (optional)



SATA power cable (optional)

Refer to the illustration below for proper installation:

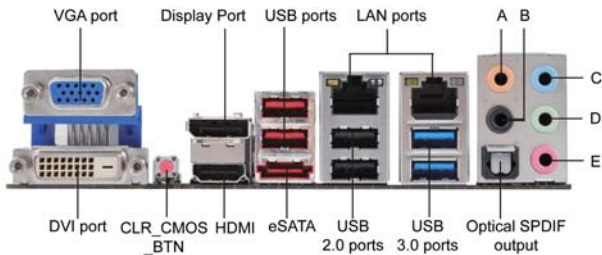
- 1 Attach either cable end to the connector on the motherboard.
- 2 Attach the other cable end to the SATA hard drive.
- 3 Attach the SATA power cable to the SATA hard drive and connect the other end to the power supply.



This motherboard supports the “Hot-Plug” function.

Connecting I/O Devices

The backplane of the motherboard has the following I/O ports:



VGA Port

Connect your monitor to the VGA port.

DVI Port

Connect the DVI port to the monitor.

CLR_CMOS_BTN

Use the CLR_CMOS button to clear CMOS.

Display Port

Connect the Display port to the monitor.

HDMI Port

Connect the HDMI port to the HDMI devices.

eSATA Port

Use these ports to connect to external SATA boxes or Serial ATA port multipliers.

LAN Ports

Connect an RJ-45 jack to the LAN port to connect your computer to the Network.

USB 2.0 Ports

Use the USB 2.0 ports to connect USB 2.0 devices.

USB 3.0 Ports

Use the USB 3.0 ports to connect USB 3.0 devices.



The USB 3.0 connectors are optimized for SuperSpeed USB 3.0 devices, aslo are fully backwards-compatible with Hi-Speed USB 2.0 devices.

Optical SPDIF Output

This jack connects to external optical digital audio output devices.

Audio Ports

Use the audio jacks to connect audio devices. The C port is for stereo line-in signal, while the E port is for microphone in signal. This motherboard supports audio devices that correspond to the A, B, and D port respectively. In addition, both of the 2 ports, B, and D provide users with both right & left channels individually. Users please refer to the following note for specific port function definition.



A: Center & Woofer	D: Front Out
B: Back Surround	E: Mic_in Rear
C: Line-in	-

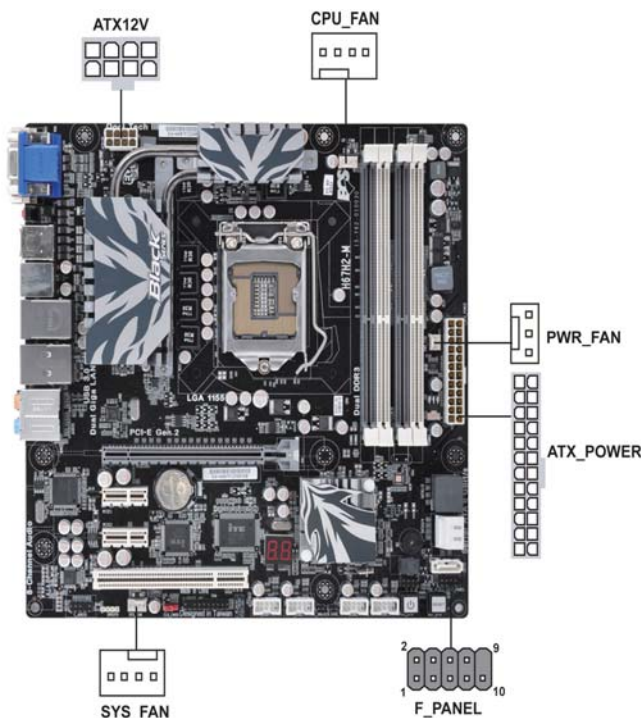
The above port definition can be changed to audio input or audio output by changing the driver utility setting.

Installing the Motherboard

Connecting Case Components

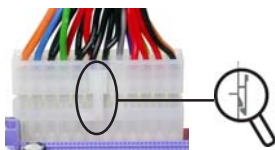
After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:

- 1 Connect the CPU cooling fan cable to **CPU_FAN**.
- 2 Connect the standard power supply connector to **ATX_POWER**.
- 3 Connect the case switches and indicator LEDs to the **F_PANEL**.
- 4 Connect the system cooling fan connector to **SYS_FAN**.
- 5 Connect the auxiliary case power supply connector to **ATX12V**.
- 6 Connect the power cooling fan connector to **PWR_FAN**.



Connecting 24-pin power cable

The ATX 24-pin connector allows you to connect to ATX v2.x power supply.



24-pin power cable

With ATX v2.x power supply, users please note that when installing 24-pin power cable, the latches of power cable and the ATX1 match perfectly.



Connecting 8/4-pin power cable

Users please note that the 8-pin and 4-pin power cables can both be connected to the ATX12V connector.



8-pin power cable

When installing 8-pin power cable, the latches of power cable and the ATX12V connector match perfectly.



4-pin power cable

When installing 4-pin power cable, the latch falls on the left side of the ATX12V connector.

CPU_FAN: CPU cooling FAN Power Connector

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor
4	PWM	PWM



Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.

PWR_FAN: Cooling FAN Power Connector

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor

SYS_FAN: System cooling FAN Power Connector

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor
4	PWM	PWM

ATX_POWER: ATX 24-pin Power Connector

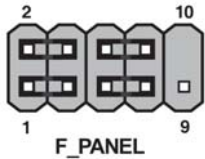
Pin	Signal Name	Pin	Signal Name
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS_ON
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	PWRGD	20	-5V
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

ATX12V: ATX 12V Power Connector

Pin	Signal Name	Pin	Signal Name
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V

Front Panel Header

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases. Refer to the table below for information:



Pin	Signal	Function	Pin	Signal	Function
1	HD_LED_P	Hard disk LED(+)	2	FP PWR/SLP	*MSG LED(+)
3	HD_LED_N	Hard disk LED(-)	4	FP PWR/SLP	*MSG LED(-)
5	RST_SW_N	Reset Switch(-)	6	PWR_SW_P	Power Switch(+)
7	RST_SW_P	Reset Switch(+)	8	PWR_SW_N	Power Switch(-)
9	RSVD	Reserved	10	Key	No pin

* MSG LED (dual color or single color)

Hard Drive Activity LED

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. For the LED to function properly, an IDE drive should be connected to the onboard IDE interface. The LED will also show activity for devices connected to the SCSI (hard drive activity LED) connector.

Power/Sleep/Message waiting LED

Connecting pins 2 and 4 to a single or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

Reset Switch

Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

Power Switch

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3

Using BIOS

About the Setup Utility

The computer uses the latest “American Megatrends Inc.” BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system’s configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

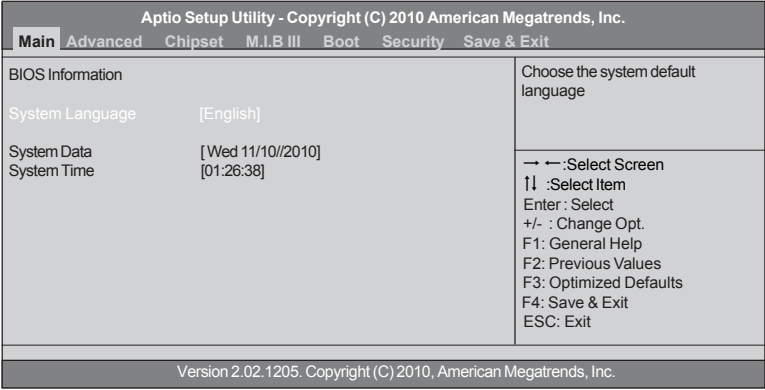
- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

Press the delete key to access BIOS Setup Utility.



Resetting the Default CMOS Values

When powering on for the first time, the POST screen may show a “CMOS Settings Wrong” message. This standard message will appear following a clear CMOS data at factory by the manufacturer. You simply need to Load Default Settings to reset the default CMOS values.

Note: Changes to system hardware such as different CPU, memories, etc. may also trigger this message.



Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ►) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

Using BIOS

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ►.



The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

BIOS Navigation Keys

The BIOS navigation keys are listed below:

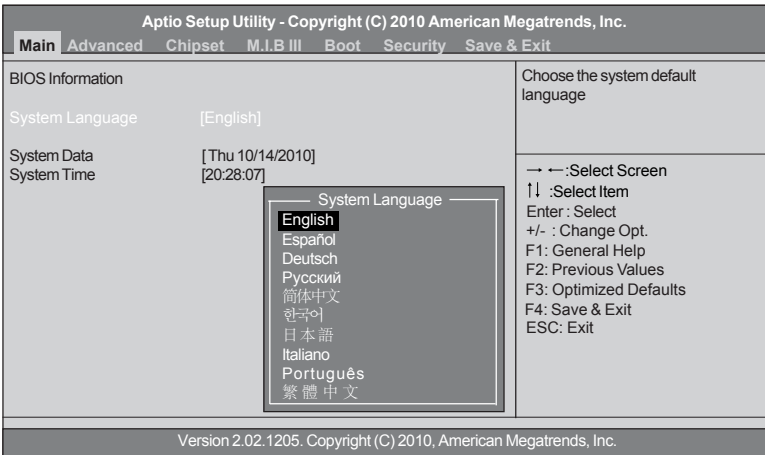
KEY	FUNCTION
ESC	Exits the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Modifies the selected field's values
Enter	Select
F1	General Help
F2	Previous Value
F3	Optimized Defaults
F4	Save & Exit



For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS. Please visit the manufacture's website for updated manual.

Main Menu

When you enter the BIOS Setup program, the main menu appears, giving you an overview of the basic system information. Select an item and press <Enter> to display the submenu.





Multi-Language BIOS

Multi-language BIOS allows you to see and set up the BIOS with your native language. It helps Non-English users to solve the problem of setting up the BIOS and achieve extra system performance easily.

Date & Time

The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

Advanced Menu

The Advanced menu items allow you to change the settings for the CPU and other system.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.	
Main	Advanced Chipset M.I.B III Boot Security Save & Exit
Legacy OpROM Support	
Launch PXE OpROM	[Disabled]
Launch Storage OpROM	[Enabled]
▶ LAN Configuration	
▶ ECS eJIFFY Function	
▶ PC Health Status	
▶ Power Management Setup	
▶ ACPI Settings	
▶ CPU Configuration	
▶ SATA Configuration	
▶ USB Configuration	
▶ Super IO Configuration	
▶ Trusted Computing	
	Enable/Disable Onboard LAN Option ROM
	→ ← :Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.	

Launch PXE OpROM (Disabled)

Use this item to enable or disable the PXE OpROM.

Launch Storage OpROM (Enabled)

Use this item to enable or disable the Storage OpROM.

LAN Configuration

The item in the menu shows the LAN-related information that the BIOS automatically detects.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.	
Main	Advanced Chipset M.I.B III Boot Security Save & Exit
LAN Configuration	Enable/Disable Onboard LAN Controller
Onboard LAN 1 Controller	[Enabled]
Onboard LAN 2 Controller	[Enabled]
	→ ←:Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.	

Onboard LAN 1/2 Controller (Enabled)

Use this item to enable or disable the Onboard LAN.

Press <Esc> to return to the Advanced Menu page.

ECS eJIFFY Function

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.	
Main	Advanced Chipset M.I.B III Boot Security Save & Exit
ECS eJIFFY Function	Make sure that the eJIFFY has been installed to hard disk.
ECS eJIFFY Function	[Disabled]
	→ ←:Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.	

ECS eJIFFY Function (Disabled)

This item enables or disables ECS eJIFFY Function.

Press <Esc> to return to the Advanced Menu page.

PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the paeameters for critical voltages, temperatures and fan speeds.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B III Boot Security Save & Exit
PC Health Status		
▶Smart Fan Function		
System Temperature	: 33°C	→ ←:Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
CPU Fan Speed	: 2974 RPM	
System Fan Speed	: 0 RPM	
CPU Voltage	: 1.236V	
IMC Voltage	: 1.056V	
DIMM Voltage	: 0.456V	
PCH Voltage	: 1.056V	
-- PEFI Mode --		
Offset to TCC Activation Temp : -49		
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

▶ Smart Fan Function

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B III Boot Security Save & Exit
CPU SMART Fan Control	[Enabled]	<div>→ ←:Select Screen</div> <div>↑↓ :Select Item</div> <div>Enter : Select</div> <div>+/- : Change Opt.</div> <div>F1: General Help</div> <div>F2: Previous Values</div> <div>F3: Optimized Defaults</div> <div>F4: Save & Exit</div> <div>ESC: Exit</div>
SMART Fan Mode	[Normal]	
SMART Fan start PWM value	180	
SMART Fan start PWM TEMP(-)	30	
Delta T	+3	
SMART Fan Slope PWM value	10 PWM value/unite	
CPU Fan Full Speed Offset (-)	23	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

CPU SMART FAN Control (Enabled)

This item allows you to enable/disable the control of the CPU fan speed by changing the fan voltage.

SMART Fan Mode (Normal)

This item allows you to select the fan mode (Normal, Quiet, Silent, or Manual) for a better operation environment. If you choose Normal mode, the fan speed will be auto adjusted depending on the CPU temperature. If you choose Quite mode, the fan speed will be auto minimized for quiet environment. If you choose Silent mode, the fan speed will be auto restricted to make system more quietly. If you choose Manual mode, the fan speed will be adjust depending on users' parameters.

SMART Fan start PWM value (180)

This item is used to set the start PWM value of the smart fan.

SMART Fan start TEMP(-) (30)

This item is used to set the start temperature of the smart fan.

DeltaT (+3)

This item specifies the range that controls CPU temperature and keeps it from going so high or so low when smart fan works.

SMART Fan Slope PWM value (10 PWM value/unite)

This item is used to set the Slope Select PWM of the smart fan.

CPU Fan Full Speed Offset(-) (23)

This item is used to set the CPU fan full speed offset value.

Press <Esc> to return to the PC Health Status page.

System Component Characteristics

These items display the monitoring of the overall inboard hardware health events, such as System & CPU temperature, CPU & DIMM voltage, CPU & system fan speed,... etc.

- System Temperature
- CPU Fan Speed
- System Fan Speed
- CPU Voltage
- DIMM Voltage
- IMC Voltage
- PCH Voltage

Press <Esc> to return to the Advanced Menu page.

Power Management Setup

This page sets up some parameters for system power management operation.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B III Boot Security Save & Exit
Power Management Setup		About Resume by PCI/PCI-E/Lan PME
Resume By PCI/PCI-E/Lan PME	[Disabled]	→ ←:Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Resume By USB (S3)	[Disabled]	
EUP Function	[Enabled]	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

Resume By PCI/PCI-E/Lan PME (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume if there is an incoming call on the PCI Modem or PCI LAN card. You must use an ATX power supply in order to use this feature. Use this item to do wake-up action if inserting the PCI card.

Resume By PS2 MS (S3) (Disabled)

This item enables or disables you to allow mouse activity to awaken the system from power saving mode.

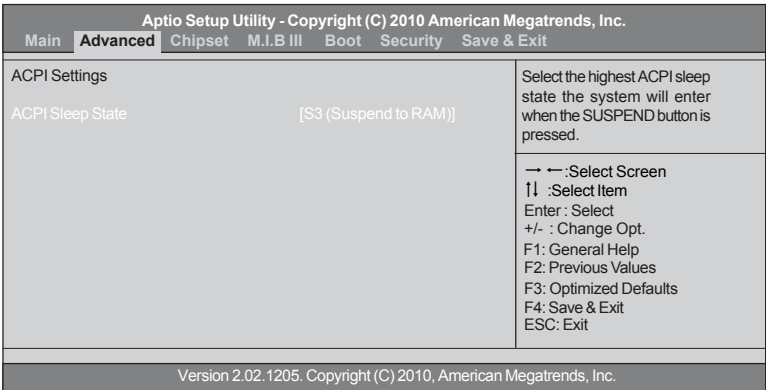
EUP Support (Enabled)

This item allows user to enable or disable EUP support.

Press <Esc> to return to the Advanced Menu page.

ACPI Configuration

The item in the menu shows the highest ACPI sleep state when the system enters suspend.



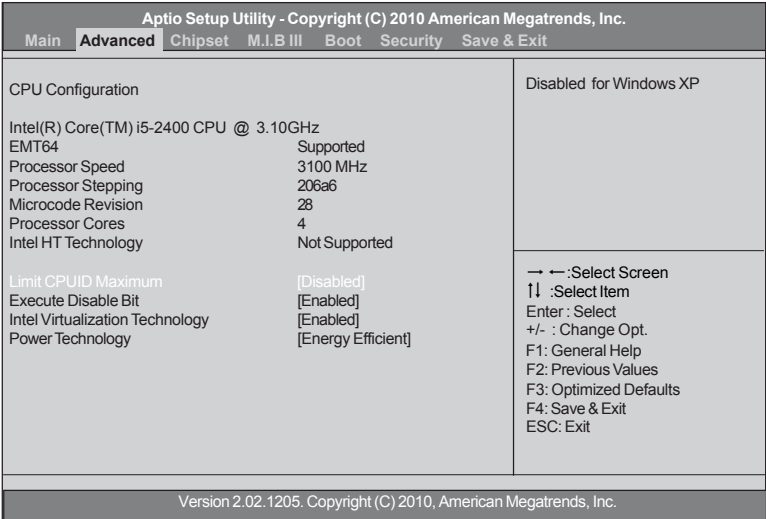
ACPI Sleep State (S3(Suspend to RAM))

This item allows user to enter the APCI S3 (Suspend toRAM) Sleep State(default).

Press <Esc> to return to the Advanced Menu page.

CPU Configuration

Scroll to this item and press <Enter> to view the following screen:



Inter(R) Core(TM) i5-2400 CPU @ 3.10 GHz

This is display-only field and displays the information of the CPU installed in your computer.

EMT64 (Supported)

This item shows the computer supports EMT64.

Processor Speed (3100MHz)

This item shows the current processor speed.

Processor Stepping (206a6)

This item shows the processor stepping version.

Microcode Revision (28)

This item shows the Microcode version.

Processor Cores (4)

This item shows the core number of the processor.

Intel HT Technology (Not Supported)

This item shows that your computer supports Intel HT technology or not.

Limit CPUID Maximum (Disabled)

Use this item to enable or disable the maximum CPUID value limit. When supports Prescott and LGA775 CPUs, enables this to prevent the system from “rebooting” when trying to install Windows NT 4.0.

Excute Disable Bit (Enabled)

This item allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation. Replacing older computers with Execute Disable Bit enabled systems can halt worm attacks, reducing the need for virus related repair.

Intel Virtualization Technology (Enabled)

When disabled, a VMM cannot utilize the additional hardware capabilities provided by Vndor Pool Technology.

Power Technology (Energy Efficient)

Use this item to control the Energy mode of the processor.

Press <Esc> to return to the Advanced Menu page.

SATA Configuration

Use this item to show the mode of serial SATA configuration options.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B III Boot Security Save & Exit
SATA Configuration		(1) IDE Mode. (2) AHCI Mode. (3) RAID Mode.
SATA Mode	[IDE Mode]	
Serial-ATA Controller 0	[Compatible]	
Serial-ATA Controller 1	[Enhanced]	
SATA Port1	Not Present	
SATA Port2	Not Present	
SATA Port3	Not Present	→ ←:Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
SATA Port4	Not Present	
SATA Port5	Not Present	
eSATA	Not Present	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

SATA Mode (IDE Mode)

Use this item to select SATA mode.

Serial-ATA Controller 0/1 (Compatible/Enhanced)

Use this item to select the Serial-ATA cotroller options: Disabled, Compatible, Enhanced.

SATA Port 1~5 (Not Present)

This motherboard supports five SATA channel and each channel allows one SATA device to be installed. Use these items to configure each device on the SATA channel.

eSATA (Not Present)

Use this item to configure eSATA device on the eSATA channel.

Press <Esc> to return to the Advanced Menu page.

USB Configuration

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B III Boot Security Save & Exit
USB Configuration		Enabled/Disabled All USB Devices
All USB Devices	[Enabled]	
USB 3.0 Controller	[Enabled]	
Legacy USB Support	[Enabled]	→ ← :Select Screen ↑↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

All USB Devices (Enabled)

Use this item to enable or disable all USB devices.

USB 3.0 Controller (Enabled)

Use this item to enable or disable USB 3.0 controller. We recommend users keep the default value. Disabling it might cause the USB devices not to work properly.

Legacy USB Support (Enabled)

Use this item to enable or disable support for legacy USB devices. Setting toAudio allows the system to detect the presence of the USB device at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

Press <Esc> to return to the Advanced Menu page.

Super IO Configuration

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B III Boot Security Save & Exit
Super IO Configuration		Enable or Disable output Temp. to 80-Port
Super IO Chip	IT8728	
Temp. to 80-Port	[Disabled]	
		→ ←:Select Screen ↑↓ :Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2012, American Megatrends, Inc.		

Super IO Chip (IT8728)

This item shows the information of the Super IO chip.

Temp. to 80-Port (Disabled)

This item enables or disables Temperature (° C) to 80-Port.

Trusted Computing

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset M.I.B.III Boot Security Save & Exit
TPM Configuration		Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.
TPM Support [Enabled]		
Current TPM Status Information		→ ←: Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
NO TPM Hardware		
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

TPM SUPPORT (Enabled)

This item enables or disables TPM support.

Current TPM Status Information

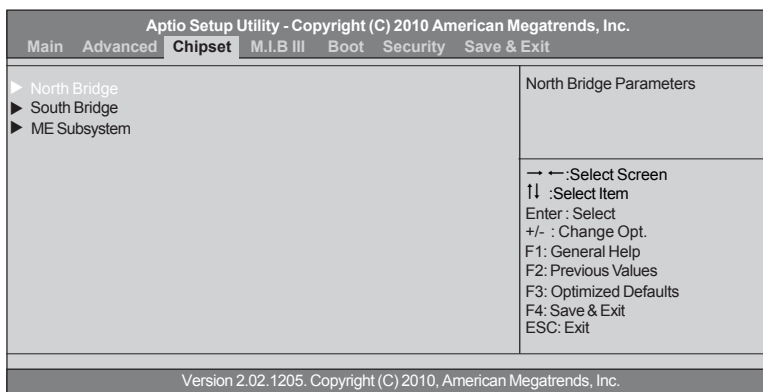
This item shows the information of current TPM status.

No TPM Hardware

This item shows the TPM Status.

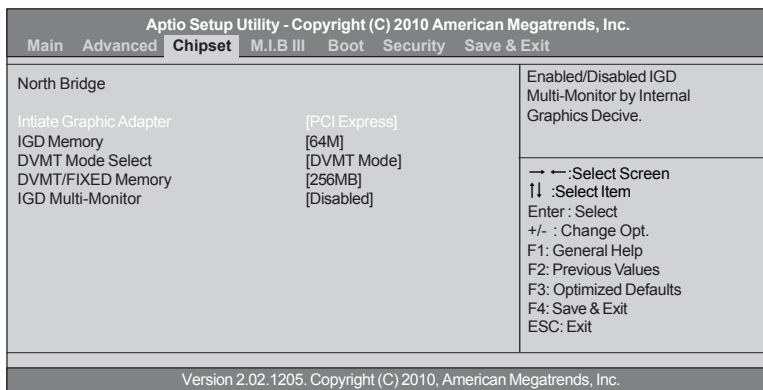
Chipset Menu

The chipset menu items allow you to change the settings for the North chipset, South chipset and other system.



► North Bridge

Scroll to this item and press <Enter> and view the following screen:



Initate Graphic Adapter (PCI Express)

This item allows you to select graphics controller to use as the primary boot device.

IGD Memory (64M)

This item shows the information of the IGD(Internal Graphics device) memory.

DVMT Mode Select (DVMT Mode)

This item allows you to select the DVMT operating mode.

DVMT/FIXED Memory (256MB)

When set to Fixed Mode, the graphics driver will reserve a fixed position of the system memory as graphics memory, according to system and graphics requirements.

IGD Multi-Monitor (Disabled)

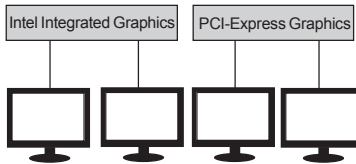
This item enables or disables IGD(Internal Graphics device) multi-monitor.

Press <Esc> to return to the chipset menu page.

Multi-Monitor technology

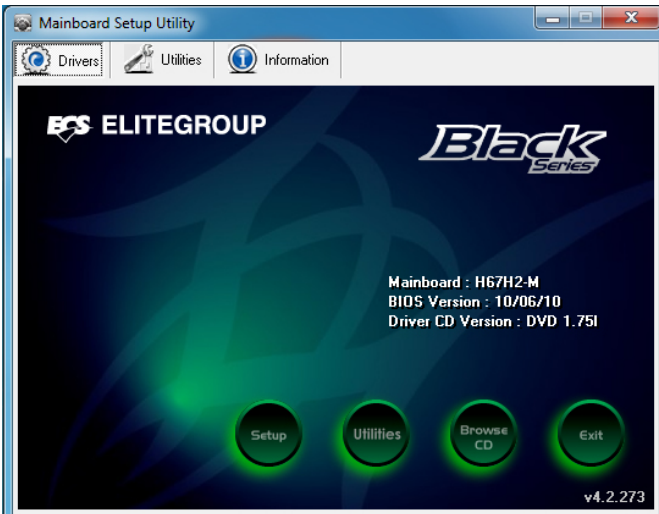
Multi-Monitor technology can help you to increase the area available for programs running on a single computer system through using multiple display devices.

It is not only to increase larger screen viewing but also to improving personal productivity.

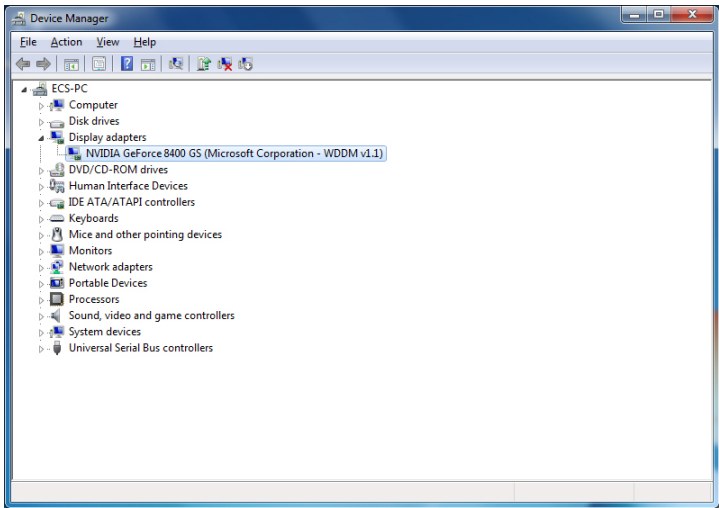


Please note that Multi-Monitor technology supports up to four monitors: one or two Intel integrated Graphics and one or two PCI-Express graphics devices under Windows 7.

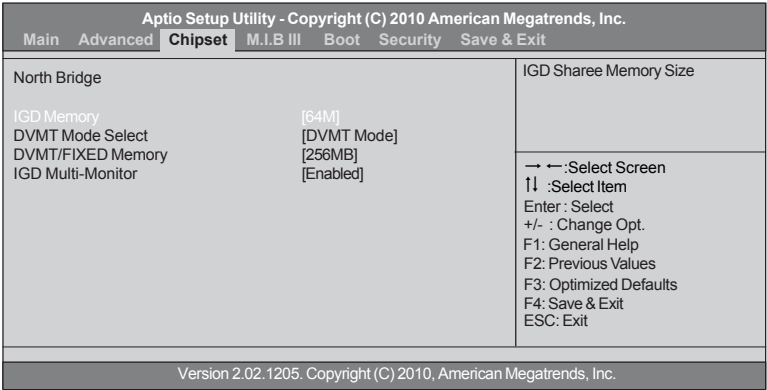
Step 1. Insert ECS drives DVD to run Auto setup or browse the DVD to install Intel chipset drivers, VGA and sound drivers.(If you want know the detail information, please refer to chapter 4.)



Step 2. Install all the drivers of PCI-Express graphic cards. Click the Browse CD item, then appears the following screen. Select the driver you want to install(e.g NVIDIA GeForce 8400 GS(Microsoft Corporation-WDDM v1.1)) and double click it.

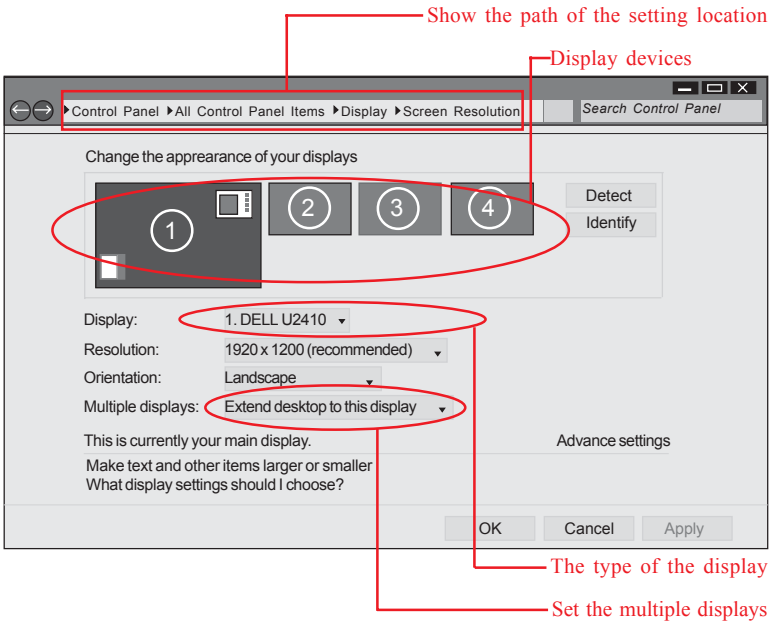


Step 3. Enable IGD Multi-Monitor from BIOS. In the following BIOS screen, please set IGD Multi-Monitor to [Enabled].

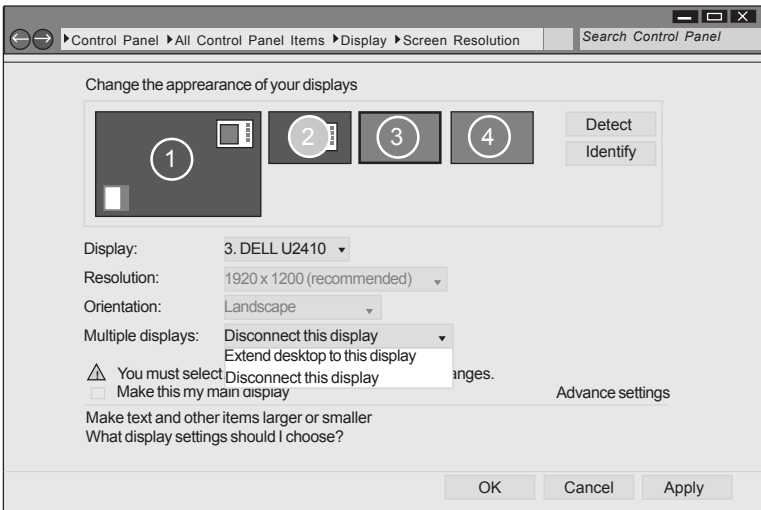


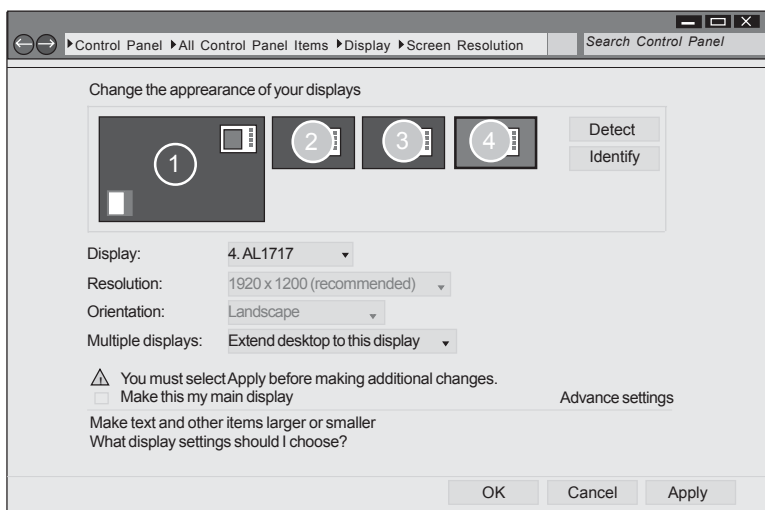
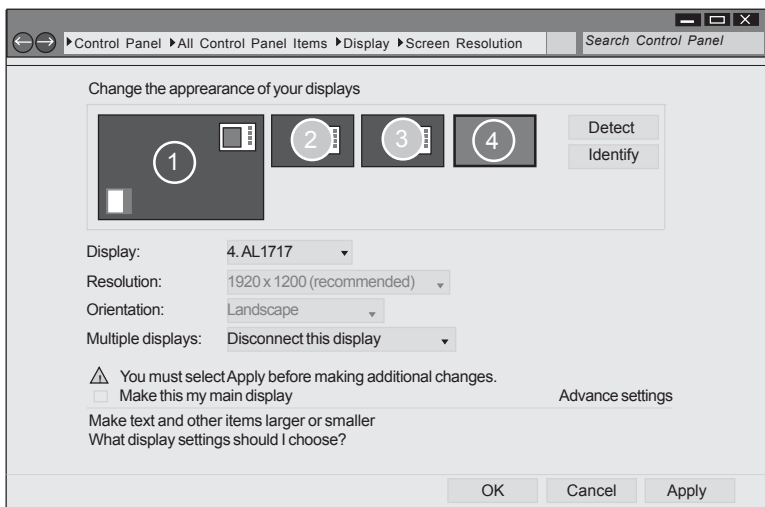
Step 4. Change the appearance of your displays under Windows 7.

1. Enter the Control Panel menu, select the Display in the All Control Panel Items and click the Screen Resolution, then appears the following screen.



2. Select display devices, set the multiple displays option and to extend desktop for display "Multi-Monitor technology".





► **South Bridge**

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset
M.I.B III	Boot	Security
Save & Exit		
South Bridge		Specify what state to go to when power is re-applied after a power failure (G3 state).
Restore AC Power Loss	[Power Off]	
Audio Configuration		→ ←:Select Screen
Azalia HD Audio	[Enabled]	↑↓ :Select Item
Azalia Internal HDMI codec	[Enabled]	Enter : Select
Case Open Warning	[Disabled]	+/- : Change Opt.
Chassis Opened	[No]	F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

Restore AC Power Loss (Power Off)

This item enables your computer to automatically restart or return to its operating status.

Audio Configuration

This item shows the information of the audio configuration.

Azalia HD Audio (Enabled)

This item enables or disables Azalia HD audio.

Azalia Internal HDMI codec (Enabled)

This item enables or disables Azaia Internal HDMI codec.

Case Open Warning (Disabled)

This item enables or disables the warning if the case is opened up, and the item below indicates the current status of the case.

Chassis Opened (No)

This item indicates whether the case has been opened.

Press <Esc> to return to the chipset menu page.

► ME Subsystem

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.	
Main Advanced Chipset M.I.B III Boot Security Save & Exit	
Intel ME Subsystem Configuration	ME Subsystem Help
ME Version 7.0.0.1135	
ME Subsystem [Enabled]	→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.	

ME Version (7.0.0.1135)

This item shows the ME version.

ME Subsystem (Enabled)

This item allows you to enable or disable ME subsystem.

M.I.B III (MB Intelligent BIOS III) Menu

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset
M.I.B III	Boot	Security
Save & Exit		
M.I.B III (MB Intelligent BIOS III)		Integrated Clock Chip Parameters
▶ Integrated Clock Chip Configuration		
▶ Performance Tuning		
Auto Detect DIMM/PCI Clk	[Enabled]	
Spread Spectrum	[Enabled]	
B.O.M.P Technology	[Enabled]	
Command Rate	[Auto]	
CPU Voltage	[Default]	
DIMM Voltage	[Default]	
IMC Voltage	[Default]	
Intel(R) Core(TM) i5-2400 CPU @ 3.10GHz		
Processor Speed	3100 MHz	
Total Memory	2048 MB (DDR3 1333)	
CPU Current Voltage	1.236V	
Graphic Voltage	1.524V	
VDIMM	0.456V	
IMC	1.056V	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

▶ Integrated Clock Chip Configuration

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset
M.I.B III	Boot	Security
Save & Exit		
Integrated Clock Chip Configuration		Integrated Clock Chip Enabled/Disabled.
ICC OverClocking Lib Version	7.0.0.29	
Number of ICC Profiles :	N/A	
Current ICC Profile Index :	N/A	
ICC Enable	[Disabled]	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.		

ICC Over-Clocking Lib Version (7.0.0.29)

This item shows the ICC over-clocking lib version.

Number of ICC Profiles (N/A)

This item shows number of ICC profiles.

Current ICC Profiles Index (N/A)

This item shows current ICC profiles index.

ICC Enable (Disabled)

This item allows you to enable or disable current ICC.

Press <Esc> to return to the M.I.B III menu page.

► Performance Tunning

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.						
Main	Advanced	Chipset	M.I.B III	Boot	Security	Save & Exit
Performance Tuning			CPU Configuration			
► CPU Configuration ► Chipset Configuration			→ ←: Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit			
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.						

► CPU Configuration

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.						
Main	Advanced	Chipset	M.I.B III	Boot	Security	Save & Exit
CPU Ratio		31	IA Core Current			
IA Core Current		[Normal]				
Power Limit 1 Value (Watt)		95				
Power Limit 2 Switch		[Enabled]				
Power Limit 2 Value		118				
Long duration maintained		1				
Enhanced Intel SpeedStep Technology		[Enabled]				
Turbo Mode		[Enabled]				
1 Core Ratio Limit		34				
2 Core Ratio Limit		33				
3 Core Ratio Limit		33				
4 Core Ratio Limit		32				
			→ ←: Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit			
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.						

CPU Ratio (31)

This item allows users to control non turbo CPU ratio.

IA Core Current (Normal)

Use this item to control CPU Current Limit. This is for Turbo mode.

Power Limit 1 Value(Watt) (95)

Use this item to control the limit of the TDP. This is for Turbo mode.

Power Limit 2 Switch (Enabled)

Use this item to control the Power Limit 2. This is for Turbo mode.

Power Limit 2 Value (118)

Use this item to control Power Limit 2. PL2 provides an upper limit of the TDP excursions. This is for Turbo mode.

Long duration maintained (1)

Use this item to control the time window over PL1 value should be maintained. This is for Turbo mode.

Enhanced Intel SpeedStep Technology (Enabled)

This item allows users to enable or disable the EIST(Enhanced Intel SpeedStep Technology).

Turbo Mode (Enabled)

This item allows you to control the Intel Turbo Boost Technology.

1/2/3/4-Core Ratio (34/33/33/32)

This item shows the Core Ratio limit value.

Press <Esc> to return to the Performance Tunning page.

► Chipset Configuration

Scroll to this item and press <Enter> to view the following screen:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.						
Main	Advanced	Chipset	M.I.B III	Boot	Security	Save & Exit
Memory Multiplier Configuration						Disabled/Enabled GE OverClocking
Memory Multiplier		[13.33]				
Memory Timing Configuration						
CAS# Latency (tcl)		9				
Row Precharge Time (tRP)		9				
RAS# to CAS# Delay (tRCD)		9				
RAS# Active Time (tRAS)		24				
Intel Graphics Configuration						
GT OverClocking		[Disabled]				
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.						

Memory Multiplier

This item shows the value of Memory Multiplier.

Memory Timing Configuration

This item shows the information of Memory Timing Configuration.

CAS#Latency(tcl) (9)

This item determines the operation of DDR SDRAM memory CAS(column address strobe). It is recommended that you leave this item at the default value. The 2T setting requires faster memory that specifically supports this mode.

Row Precharge Time(tRP) (9)

This item specifies Row precharge to Active or Auto-Refresh of the same bank.

RAS# to CAS# Delay(tRD) (9)

This item specifies the RAS# to CAS# delay to Rd/Wr command to the same bank.

RAS# Active Time(tRAS) (24)

This item specifies the RAS# active time.

Intel Graphics Configuration

This item shows the information of Intel Graphics Configuration.

GT OverClocking [Disabled]

This item allows you to control the internal GFX Turbo mode.

Press <Esc> to return to the Performance Tunning page.

Press <Esc> to return to the M.I.B III menu page.

Auto Detect DIMM/PCI Clk (Enabled)

When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.

Spread Spectrum (Enabled)

If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

B.O.M.P Technology (Enabled)

This item allows users to enable or disable B.O.M.P technology. This function can run safe setting to setup menu when system boot fail 3 times.

Command Rate (Auto)

This item allows users to set command rate.

DIMM Voltage (Default)

This item allows users to adjust the DIMM voltage.

CPU Voltage (Default)

This item allows users to adjust the CPU voltage.

IMC Voltage (Default)

This item allows users to adjust the IMC voltage.

Intel(R) Core(TM) i5-2400 CPU @ 3.10 GHz

This is display-only field and displays the information of the CPU installed in your computer.

Processor Speed (3100MHz)

This item shows the CPU speed.

Total Memory (2048MB(DDR3 1333))

This item shows the total momery of DDR3.

CPU Current Voltage (0.984V)

This item diplays the CPU current voltage.

Graphic Voltage (1.524V)

This item diplays the current Graphic voltage.

VDIMM (0.456V)

This item displays the current VDIMM voltage.

IMC (1.056V)

This item displays the current IMC voltage.

Boot Menu

This page enables you to set the keyboard NumLock state.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.	
Main Advanced Chipset M.I.B III Boot Security Save & Exit	
Boot Configuration	Select the keyboard NumLock state
Bootup NumLock State [On]	
Quiet Boot [Enabled]	
Boot Option Priorities	→ ←:Select Screen ↑ ↓ :Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.	

Boot Configuration

This item shows the information of the boot configuration.

Bootup NumLock State (On)

This item determines if the NumLock key is active or inactive at system start-up time.

Quiet Boot (Enabled)

If enbled, BIOS will show a full screen logo at boot, if disabled, BIOS will set the initial display mode to BIOS and show the diagnostic POST screen at boot.

Boot Option Priorities

This item enables you to select boot priorities for all boot devices.

Security Menu

This page enables you to set setup administrator and password.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.					
Main	Advanced	Chipset	M.I.B III	Boot	Security
				Save & Exit	
<p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.</p> <p>If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.</p> <p>The password must be 3 to 20 characters long.</p> <p>Administrator Password</p>				Set Setup Administrator Password	
				→ ←:Select Screen ↑↓ :Select Item Enter : Select +/- : Value F1:General Help F2:Previous Value F3:Optimized Defaults F4:Save & Exit ESC:Exit	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.					

Administrator Password

This item allows you to set or change administrator password.

Save & Exit Menu

This page enables you to exit system setup after saving or without saving the changes.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.	
Main Advanced Chipset M.I.B III Boot Security Save & Exit	
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset	Exit system setup after saving the changes.
Save Options Save Changes Discard Changes	→ ←: Select Screen ↑ ↓ : Select Item Enter : Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Restore Defaults Save as User Defaults Restore User Defaults	
Boot Override	
Version 2.02.1205. Copyright (C) 2010, American Megatrends, Inc.	

Save Changes and Exit

This item enables you to save the changes that you have made and exit.

Discard Changes and Exit

This item enables you to discard any changes that you have made and exit.

Save Changes and Reset

This item enables you to save the changes that you have made and reset.

Discard Changes and Reset

This item enables you to discard any changes that you have made and reset.

Save Options

This item enables you to save the options that you have made.

Save Changes

This item enables you to save the changes that you have made.

Discard Changes

This item enables you to discard any changes that you have made.

Restore Defaults

This item enables you to restore the system defaults.

Save as User Defaults

This item enables you to save the changes that you have made as user defaults.

Restore User Defaults

This item enables you to restore user defaults.

Boot Override

Use this item to select the boot device.

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Web site. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

- 1 If your motherboard has a BIOS protection jumper, change the setting to allow BIOS flashing.
- 2 If your motherboard has an item called Firmware Write Protect in Advanced BIOS features, disable it. (Firmware Write Protect prevents BIOS from being overwritten.)
- 3 Prepare a bootable device or create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)
- 4 Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the bootable device.
- 5 Turn off your computer and insert the bootable device in your computer. (You might need to run the Setup Utility and change the boot priority items on the Advanced BIOS Features Setup page, to force your computer to boot from the bootable device first.)
- 6 At the C:\ or A:\ prompt, type the Flash Utility program name and the file name of the new BIOS and then press <Enter>. Example: AFUDOS.EXE 040706.ROM
- 7 When the installation is complete, remove the bootable device from the computer and restart your computer. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten. The computer will restart automatically.

This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

Chapter 4

Using the Motherboard Software

About the Software DVD-ROM/CD-ROM

The support software DVD-ROM/CD-ROM that is included in the motherboard package contains all the drivers and utility programs needed to properly run the bundled products. Below you can find a brief description of each software program, and the location for your motherboard version. More information on some programs is available in a README file, located in the same directory as the software. Before installing any software, always inspect the folder for files named README.TXT or something similar. These files may contain important information that is not included in this manual.

1. Never try to install all software from folder that is not specified for use with your motherboard.
2. The notice of Intel HD Audio Installation (optional): The Intel High Definition audio functionality unexpectedly quits working in Windows Server 2003 Service Pack 1 or Windows XP Professional x64 Edition. Users need to download and install the update packages from the Microsoft Download Center **“before”** installing HD audio driver bundled in the driver disk. Please log on to <http://support.microsoft.com/default.aspx?scid=kb;en-us;901105#appliesto> for more information.

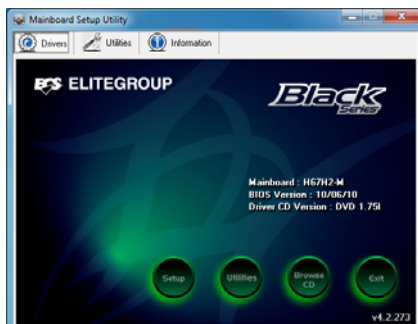
Auto-installing under Windows XP/Vista/7

The Auto-install DVD-ROM/CD-ROM makes it easy for you to install the drivers and software for your motherboard.



If the Auto-install DVD-ROM/CD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Refer to the Utility Folder Installation Notes later in this chapter.

The support software DVD-ROM/CD-ROM disc loads automatically under Windows XP/Vista/7. When you insert the DVD-ROM/CD-ROM disc in the DVD-ROM/CD-ROM drive, the autorun feature will automatically bring up the install screen. The screen has three buttons on it, Setup, Browse CD and Exit.



* For reference only



If the opening screen does not appear; double-click the file “setup.exe” in the root directory.

Using the Motherboard Software

Drivers

Setup	Click the Setup button to run the software installation program. Select from the menu which software you want to install.
Utilities	Click the Utilities button to display the application software and other software utilities that are available on the disk. Select the software you want to install then follow installation procedure.
Browse CD	<p>The Browse CD button is the standard Windows command that allows you to open Windows Explorer and show the contents of the support disk.</p> <p>Before installing the software from Windows Explorer, look for a file named README.TXT or something similar. This file may contain important information to help you install the software correctly.</p> <p>Some software is installed in separate folders for different operating systems.</p> <p>In installing the software, execute a file named SETUP.EXE by double-clicking the file and then following the instructions on the screen.</p>
Exit	The EXIT button closes the Auto Setup window.

Utilities

Lists the software utilities that are available on the disk.

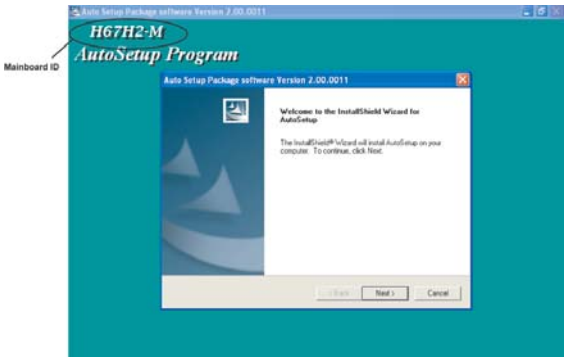
Information

Displays the path for all software and drivers available on the disk.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

- 1. Click **Setup**. The installation program begins:

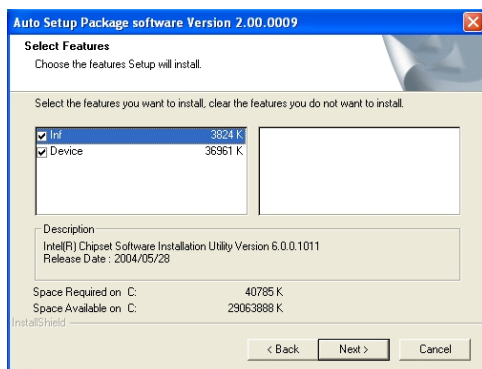


The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

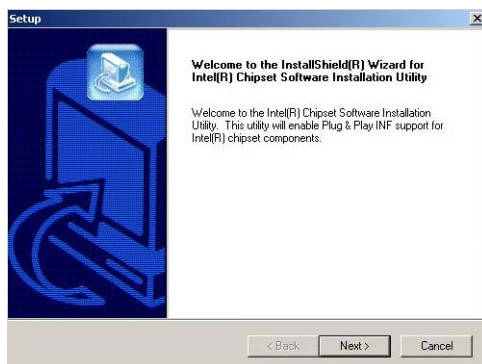
The motherboard identification is located in the upper left-hand corner.

Using the Motherboard Software

2. Click **Next**. The following screen appears:



3. Check the box next to the items you want to install. The default options are recommended.
4. Click **Next** run the Installation Wizard. An item installation screen appears:



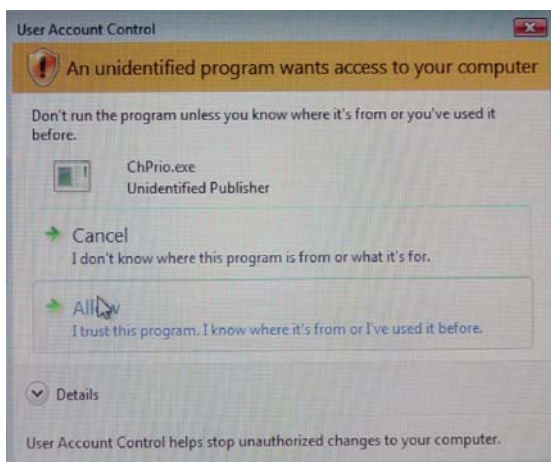
5. Follow the instructions on the screen to install the items.



Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to restart a few times to complete the installation.



Windows Vista/7 will appear below UAC (User Account Control) message after the system restart. You must select “Allow” to install the next driver. Continue this process to complete the drivers installation.



Manual Installation

Insert the disk in the DVD-ROM/CD-ROM drive and locate the PATH.DOC file in the root directory. This file contains the information needed to locate the drivers for your motherboard.

Look for the chipset and motherboard model; then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

Utility Software Reference

All the utility software available from this page is Windows compliant. They are provided only for the convenience of the customer. The following software is furnished under license and may only be used or copied in accordance with the terms of the license.



These software(s) are subject to change at anytime without prior notice. Please refer to the support disk for available software.

Using the Motherboard Software

Chapter 5

Intel® Matrix Storage Manager RAID Configurations

The Intel® Matrix Storage Manager allows you to configure RAID 0, and 1 sets on the external Serial ATA hard disk drives.

Before creating a RAID set

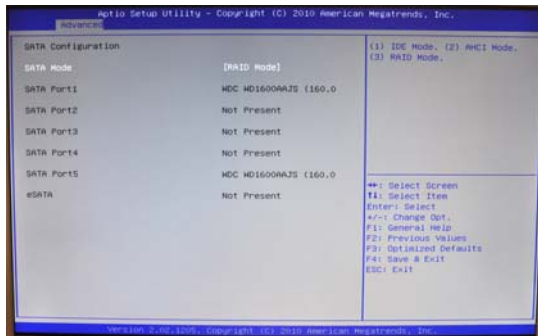
Prepare the following items:

1. One SATA HDD.
2. A write-enabled floppy disk.
3. Microsoft® Windows® OS installation disk (Windows XP/Vista).
4. Motherboard support CD with Intel® Matrix Storage Manager driver.

Complete the following steps before you create a RAID set:

1. Install the external Serial ATA hard disk drive (HDD) on your system.
2. Change “SATA Mode” from “IDE Mode” to “RAID Mode”

See section “SATA Configuration” for details.



3. Enter the Intel® Matrix Storage Manager option to set up your RAID configuration.
4. Create an Intel® Matrix Storage Manager driver disk for Windows® OS installation. See section “Creating a RAID driver disk” for details.
5. Install the Intel® Matrix Storage Manager driver after the Windows® OS had been installed.

Entering Intel® Matrix Storage Manager RAID BIOS utility

- 1. During POST, press <Ctrl-I> to enter the Intel® Matrix Storage Manager RAID BIOS menu.



- 2. The main Intel® Matrix Storage Manager RAID BIOS menu appears.
- 3. Use the arrow keys to move the color bar and navigate through the items.

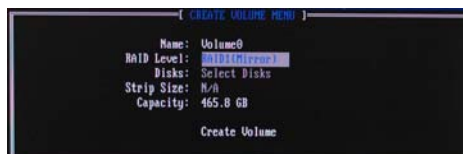
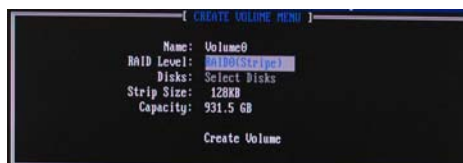


Creating a RAID set

1. In the main Intel® Matrix Storage Manager RAID BIOS menu, highlight *Create RAID Volume* using the up/down arrow key then press <Enter>.



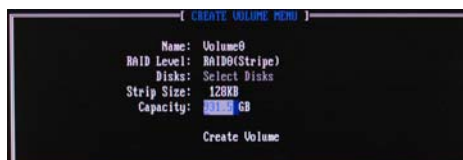
2. When the *RAID Level* item is highlighted, use the up/down arrow key to select the RAID set that you want to create.



When more than two HDDs are installed in your computer, the *Disks* item will be selectable. Then users can select the HDD that you want to belong to the RAID set. Please be noticed that selecting a wrong disk will result in losing the original data of the HDD.



3. Key in the RAID volume capacity. Use the up/down arrow to choose the *Capacity*. The default value indicates the maximum capacity using the selected disks. Entering a lower capacity allows you to create a second volume on these disks.

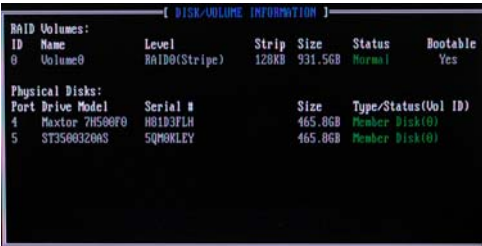


- 4. When done, press <Enter> to confirm the creation of the RAID set. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

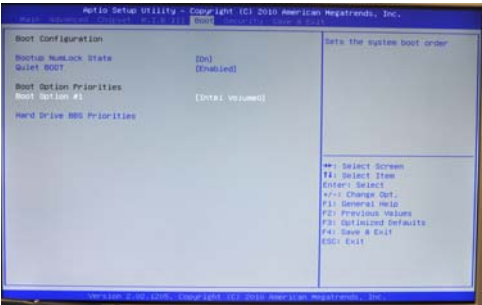


Pressing <Y> deletes all the data in the HDDs.

- 5. The following screen appears, displaying the relevant information about the RAID set you created.

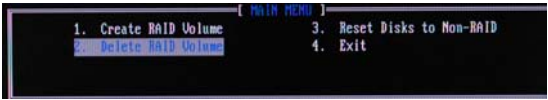


Users please be noted that RAID 0 (Stripe) is set to accelerate the data access, and RAID 1 (Mirror) is set to provide the data backup. If you want to set RAID 0, you need to set the *2nd Boot Device* item in the BIOS to *Intel Volume0*. See section “Advanced Setup” for details.

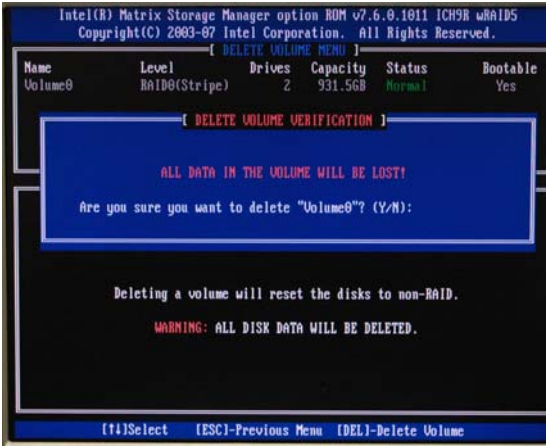


Deleting a RAID set

1. In the main Intel® Matrix Storage Manager RAID BIOS menu, highlight *Delete RAID Volume* using the up/down arrow key then press <Enter>.



2. Use the space bar to select the RAID set you want to delete.
Press the key to delete the set.
3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.



Pressing <Y> deletes all the data in the HDDs.

Resetting disks to Non-RAID



An HDD that has been previously configured as part of another RAID set in another platform is called a broken RAID HDD. When you install a broken RAID HDD, you cannot select this disk when configuring a RAID set through the Intel® Matrix Storage Manager option. If you still want to use this broken RAID HDD as part of the RAID set configured through the Intel® Matrix Storage Manager, you may do so by resetting the disk to Non-RAID. You will, however, lose all data and previous RAID configurations.

To reset disks to Non-RAID:

1. In the main Intel® Matrix Storage Manager RAID BIOS menu, highlight *Reset Disks to Non-RAID* using the up/down arrow key then press <Enter>.



2. Use the space bar to select the HDD to reset to Non-RAID.
3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

Pressing <Y> deletes all the data in the HDDs.

Exiting Setup

When you have finished, highlight *Exit* using the up/down arrow key then press <Enter> to exit the Intel® Matrix Storage Manager RAID BIOS utility.

A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N> to return to the Intel® Matrix Storage Manager RAID BIOS menu.

Chapter 6

Trouble Shooting

Start up problems during assembly

After assembling the PC for the first time you may experience some start up problems. Before calling for technical support or returning for warranty, this chapter may help to address some of the common questions using some basic troubleshooting tips.

a) System does not power up and the fans are not running.

1. Disassemble the PC to remove the VGA adaptor card, DDR memory, LAN, USB and other peripherals including keyboard and mouse. Leave only the motherboard, CPU with CPU cooler and power supply connected. Turn on again to see if the CPU and power supply fans are running.

2. Make sure to remove any unused screws or other metal objects such as screwdrivers from the inside PC case. This is to prevent damage from short circuit.

3. Check the CPU FAN connector is connected to the motherboard.

4. For Intel platforms check the pins on the CPU socket for damage or bent. A bent pin may cause failure to boot and sometimes permanent damage from short circuit.

5. Check the 12V power connector is connected to the motherboard.

6. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

b) Power is on, fans are running but there is no display

1. Make sure the monitor is turned on and the monitor cable is properly connected to the PC.

2. Check the VGA adapter card (if applicable) is inserted properly.

3. Listen for beep sounds. If you are using internal PC speaker make sure it is connected.

a. continuous 3 short beeps : memory not detected

b. 1 long beep and 8 short beeps : VGA not detected

c) The PC suddenly shuts down while booting up.

1. The CPU may experience overheating so it will shutdown to protect itself. Ensure the CPU fan is working properly.

2. From the BIOS setting, try to disable the Smartfan function to let the fan run at default speed. Doing a Load Optimised Default will also disable the Smartfan.

Start up problems after prolong use

After a prolong period of use your PC may experience start up problems again. This may be caused by breakdown of devices connected to the motherboard such as HDD, CPU fan, etc. The following tips may help to revive the PC or identify the cause of failure.

1. Clear the CMOS values using the CLR_CMOS jumper. Refer to CLR_CMOS jumper in Chapter 2 for Checking Jumper Settings in this user manual. When completed, follow up with a Load Optimised Default in the BIOS setup.

2. Check the CPU cooler fan for dust. Long term accumulation of dust will reduce its effectiveness to cool the processor. Clean the cooler or replace a new one if necessary.

3. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

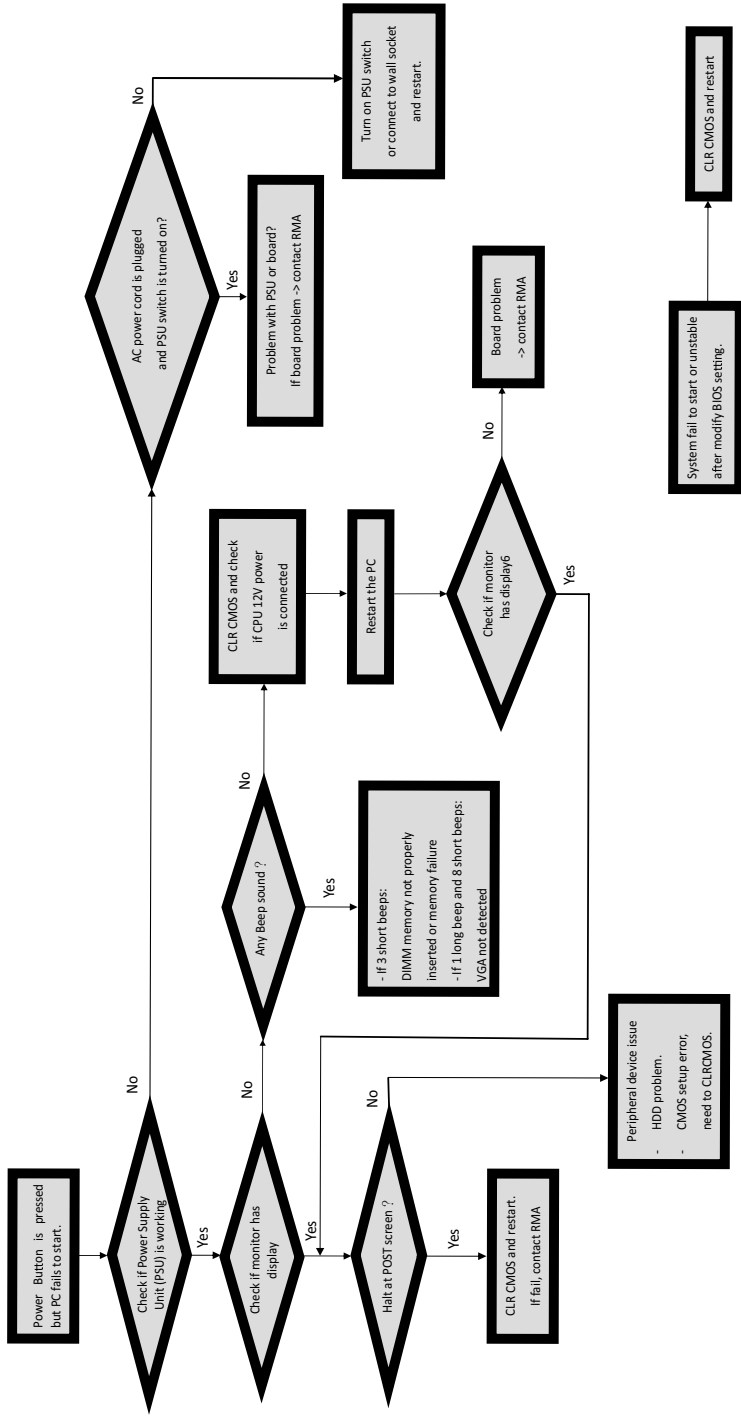
4. Remove the hard drive, optical drive or DDR memory to determine which of these component may be at fault.

Maintenance and care tips

Your computer, like any electrical appliance, requires proper care and maintenance. Here are some basic PC care tips to help prolong the life of the motherboard and keep it running as best as it can.

1. Keep your computer in a well ventilated area. Leave some space between the PC and the wall for sufficient airflow.
2. Keep your computer in a cool dry place. Avoid dusty areas, direct sunlight and areas of high moisture content.
3. Routinely clean the CPU cooler fan to remove dust and hair.
4. In places of hot and humid weather you should turn on your computer once every other week to circulate the air and prevent damage from humidity.
5. Add more memory to your computer if possible. This not only speeds up the system but also reduces the loading of your hard drive to prolong its life span.
6. If possible, ensure the power cord has an earth ground pin directly from the wall outlet. This will reduce voltage fluctuation that may damage sensitive devices.

Basic Troubleshooting Flowchart



Memo

POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS :

Checkpoint	Description
01-0F	SEC Status Codes & Errors
10-2F	PEI execution up to and including memory detection
30-4F	PEI execution after memory detection
50-5F	PEI errors
60-CF	DXE execution up to BDS
D0-DF	DXE errors
E0-E8	S3 Resume (PEI)
E9-EF	S3 Resume errors (PEI)
F0-F8	Recovery (PEI)
F9-FF	Recovery errors (PEI)
0	Not used
1	Power on, Reset type detection (soft/hard).
2	AP initialization before microcode loading
3	North Bridge initialization before microcode loading
4	South Bridge initialization before microcode loading
5	OEM initialization before microcode loading
6	Microcode loading
7	AP initialization after microcode loading
8	North Bridge initialization after microcode loading
9	South Bridge initialization after microcode loading
A	OEM initialization after microcode loading
B	Cache initialization
C-D	Reserved for future AMI SEC error codes
E	Microcode not found
F	Microcode not loaded
10	PEI Core is started
11	Pre-memory CPU initialization is started
12	Pre-memory CPU initialization (CPU module specific)
13	Pre-memory CPU initialization (CPU module specific)
14	Pre-memory CPU initialization (CPU module specific)
15	Pre-memory North Bridge initialization is started
16	Pre-Memory North Bridge initialization (North Bridge module specific)
17	Pre-Memory North Bridge initialization (North Bridge module specific)
18	Pre-Memory North Bridge initialization (North Bridge module specific)
19	Pre-memory South Bridge initialization is started
1A	Pre-memory South Bridge initialization (South Bridge module specific)
1B	Pre-memory South Bridge initialization (South Bridge module specific)
1C	Pre-memory South Bridge initialization (South Bridge module specific)
1D-2A	OEM pre-memory initialization codes
2B	Memory initialization. Serial Presence Detect (SPD) data reading
2C	Memory initialization. Memory presence detection
2D	Memory initialization. Programming memory timing information
2E	Memory initialization. Configuring memory
2F	Memory initialization (other).
30	Reserved for ASL (see ASL Status Codes section below)
31	Memory Installed
32	CPU post-memory initialization is started
33	CPU post-memory initialization. Cache initialization
34	CPU post-memory initialization. Application Processor(s) (AP) initialization

35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
36	CPU post-memory initialization. System Management Mode (SMM) initialization
37	Post-Memory North Bridge initialization is started
38	Post-Memory North Bridge initialization (North Bridge module specific)
39	Post-Memory North Bridge initialization (North Bridge module specific)
3A	Post-Memory North Bridge initialization (North Bridge module specific)
3B	Post-Memory South Bridge initialization is started
3C	Post-Memory South Bridge initialization (South Bridge module specific)
3D	Post-Memory South Bridge initialization (South Bridge module specific)
3E	Post-Memory South Bridge initialization (South Bridge module specific)
3F-4E	OEM post memory initialization codes
4F	DXE IPL is started
50	Memory initialization error. Invalid memory type or incompatible memory speed
51	Memory initialization error. SPD reading has failed
52	Memory initialization error. Invalid memory size or memory modules do not match.
53	Memory initialization error. No usable memory detected
54	Unspecified memory initialization error.
55	Memory not installed
56	Invalid CPU type or Speed
57	CPU mismatch
58	CPU self test failed or possible CPU cache error
59	CPU micro-code is not found or micro-code update is failed
5A	Internal CPU error
5B	reset PPI is not available
5C-5F	Reserved for future AML error codes
E0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
E1	S3 Boot Script execution
E2	Video repost
E3	OS S3 wake vector call
E4-E7	Reserved for future AML progress codes
E0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
E8	S3 Resume Failed in PEI
E9	S3 Resume PPI not Found
EA	S3 Resume Boot Script Error
EB	S3 OS Wake Error
EC-EF	Reserved for future AML error codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AML progress codes
F0	Recovery condition triggered by firmware (Auto recovery)
F1	Recovery condition triggered by user (Forced recovery)
F2	Recovery process started
F3	Recovery firmware image is found
F4	Recovery firmware image is loaded
F5-F7	Reserved for future AML progress codes
F8	Recovery PPI is not available
F9	Recovery capsule is not found
FA	Invalid recovery capsule

FB-FF	Reserved for future AML error codes
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL was not found
3	DXE Core Firmware Volume was not found
7	Reset PPI is not available
4	Recovery failed
4	S3 Resume failed
60	DXE Core is started
61	NVRAM initialization
62	Installation of the South Bridge Runtime Services
63	CPU DXE initialization is started
64	CPU DXE initialization (CPU module specific)
65	CPU DXE initialization (CPU module specific)
66	CPU DXE initialization (CPU module specific)
67	CPU DXE initialization (CPU module specific)
68	PCI host bridge initialization
69	North Bridge DXE initialization is started
6A	North Bridge DXE SMM initialization is started
6B	North Bridge DXE initialization (North Bridge module specific)
6C	North Bridge DXE initialization (North Bridge module specific)
6D	North Bridge DXE initialization (North Bridge module specific)
6E	North Bridge DXE initialization (North Bridge module specific)
6F	North Bridge DXE initialization (North Bridge module specific)
70	South Bridge DXE initialization is started
71	South Bridge DXE SMM initialization is started
72	South Bridge devices initialization
73	South Bridge DXE Initialization (South Bridge module specific)
74	South Bridge DXE Initialization (South Bridge module specific)
75	South Bridge DXE Initialization (South Bridge module specific)
76	South Bridge DXE Initialization (South Bridge module specific)
77	South Bridge DXE Initialization (South Bridge module specific)
78	ACPI module initialization
79	CSM initialization
7A-7F	Reserved for future AML DXE codes
80-8F	OEM DXE initialization codes
90	Boot Device Selection (BDS) phase is started
91	Driver connecting is started
92	PCI Bus initialization is started
93	PCI Bus Hot Plug Controller Initialization
94	PCI Bus Enumeration
95	PCI Bus Request Resources
96	PCI Bus Assign Resources
97	Console Output devices connect
98	Console input devices connect
99	Super IO Initialization
9A	USB initialization is started
9B	USB Reset
9C	USB Detect
9D	USB Enable

9E-9F	Reserved for future AML codes
A0	IDE initialization is started
A1	IDE Reset
A2	IDE Detect
A3	IDE Enable
A4	SCSI initialization is started
A5	SCSI Reset
A6	SCSI Detect
A7	SCSI Enable
A8	Setup Verifying Password
A9	Start of Setup
AA	Reserved for ASL (see ASL Status Codes section below)
AB	Setup Input Wait
AC	Reserved for ASL (see ASL Status Codes section below)
AD	Ready To Boot event
AE	Legacy Boot event
AF	Exit Boot Services event
B0	Runtime Set Virtual Address MAP Begin
B1	Runtime Set Virtual Address MAP End
B2	Legacy Option ROM Initialization
B3	System Reset
B4	USB hot plug
B5	PCI bus hot plug
B6	Clean-up of NVRAM
B7	Configuration Reset (reset of NVRAM settings)
B8-BF	Reserved for future AML codes
C0-CF	OEM BDS initialization codes
D0	CPU initialization error
D1	North Bridge initialization error
D2	South Bridge initialization error
D3	Some of the Architectural Protocols are not available
D4	PCI resource allocation error. Out of Resources
D5	No Space for Legacy Option ROM
D6	No Console Output Devices are found
D7	No Console Input Devices are found
D8	Invalid password
D9	Error loading Boot Option (LoadImage returned error)
DA	Boot Option is failed (StartImage returned error)
DB	Flash update is failed
DC	Reset protocol is not available
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
1	Invalid password
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met
01	System is entering S1 sleep state
02	System is entering S2 sleep state
03	System is entering S3 sleep state
04	System is entering S4 sleep state